DOCUMENT RESUME

ED 340 486 PS 020 198

AUTHOR Bowlin, Flora Samantha; Clawson, Kenneth
TITLE The Effects of Preschool on the Achievement of First, Second, Third, and Fourth Grade Reading and Math Students.
PUB DATE Nov 91
NOTE 15p.; Paper presented at the Annual Meeting of the Mid-South Educational Research Association (Lexington, KY, November 13-15, 1991).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; High Risk Students; Intermediate Grades; *Mathematics Achievement; *Outcomes of Education; *Preschool Education; Primary Education; *Reading Achievement; Student Development

ABSTRACT

The purpose of this study was to investigate the effect of a preschool program on achievement of first through fourth grade students in reading and math. The subjects of this study were 208 elementary students from the Estill County (Kentucky) School District. All the students were white, from low to middle socioeconomic classes. The experimental group included all students who had attended preschool. The control group was selected randomly from all the students in first, second, third, and fourth grades who did not have preschool experience. Some research has shown that children who attend preschool outperform children who do not attend preschool on standardized tests in later grades. Other evidence suggests that preschool experience may result in reduced placement in compensatory education, less retention in grade, and improved life chances, especially for disadvantaged children. However, formal academic programs in preschool may fail to have desired social results and produce no significant differences in academic gains. In the present study, it was hypothesized that students who had attended preschool would score significantly higher in reading and math on the Comprehensive Test of Basic Skills (CTBS) than children with similar ability who had not attended preschool. Findings did not support the hypothesis: students who had attended preschool did not score significantly higher on the CTBS in reading or math. (SH)

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The Effects of Preschool on the Achievement of First, Second, Third, and Fourth Grade Reading and Math Students

by
Flora Samantha Bowlin
and
Kenneth Clawson, Ph.D.
Eastern Kentucky University
Richmond, Kentucky 40475

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A paper presented at the 1991 Annual meeting of the Mid-South Educational Research Association, November 13-15, 1991, Lexington, Kentucky

Descriptors: Preschool Education
Reading
Mathematics

PS 020198

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Introduction and Background

As concerns for achievement test scores in later grades escalate, kindergartens are becoming more teacher directed and knowledge focused. Many educators are concerned that public school based pre-kindergarten programs will follow the same path. In the 1960's the race was on in education and the new theory for preschool and kindergarten programs that emerged was that the earlier the introduction to academics the better these students would achieve in later schooling (Seefeldt, 1985). It was then that the Head Start Program was born.

In 1988 Head Start reached only 18% of the 2.5 million children who needed it's services (Piccigallo, 1988). Congress's Select Committee on Children and Families projected that by 1990 the number of children under the age of six would be approximately 23 million with nine out of ten mothers in the work force (Evard, 1988).

In 1984, 10 states had state funded pre-kindergarten programs. In 1985 a wave of state action began. Presently, 27 states, including Kentucky, have appropriated funds for state-initiated pre-kindergarten programs (Mitchell & Modigliani, 1989).

Purpose and Significance of the Study

The purpose of this study was to investigate the effect of a preschool program on achievement of first, second, third, and fourth grade students in reading and math as measured by their scores on the Comprehensive Test of Basic Skills (CTBS). Is there a lasting effect on reading and math achievement in first, second, third, and fourth grades? Does attending preschool provide the necessary background to give at-risk children a better chance to succeed at the elementary level?

Hypotheses to be Tested

1. First grade students who attended preschool will score significantly higher in reading and math on the CTBS than children with similar ability who did not attend preschool.

2. Second grade students who attended preschool will score significantly higher in reading and math on the CTBS than children with similar ability who did not attend preschool.

3. Third grade students who attended preschool will score significantly higher in reading and math on the CTBS than children with similar ability who did not attend preschool.

4. Fourth grade students who attended preschool will score significantly higher in reading and math on the CTBS than children with similar ability who did not attend preschool.

Limitations of the Study

The following are limitations to be considered in this study:

1. This study involved a small rural county.

2. The total number of students involved was 208.

3. The experimental group was self-selected in the sense that parents sought out preschool for them.

4. Information concerning the personal background and home environment in regard to their academic achievement was not reviewed for the study.

5. The only test to measure reading and math achievement was the CTBS.

Definition of Terms

The following terms used most frequently in this paper were defined as such:

Control Group - the group of students who did not attend a preschool program.

Experimental Group - the group of students who did attend a preschool program.

Preschool - any group program for children under the age of five, with an explicit purpose of providing children with the knowledge and social competence thought to be necessary for normal development or success in public schools (Haskins, 1989).

At-risk - children who, due to poverty, broken homes, disability, or other environmental deprivation need additional and reinforcing academic stimulation and instruction just to keep up with sufficiently engaged children (Piccigallo, 1988).

Comprehensive Tests of Basic Skills - (CTBS Manual; 1990) -

a series of norm-referenced, objectives-based tests for kindergarten through twelfth grade, designed to measure achievement in reading, spelling, language, mathematics, reference skills, science, and social studies.

Review of Related Literature

Research investigators have just begun in the past two decades to explore the effects of preschool on the achievement of students. Attempts to document specific outcomes in early childhood education were relatively rare until the advent of the 1960's compensatory education movement. Research generally has been dominated by attempts to document immediate, summative program effects; longitudinal follow up studies are still limited (Evans, 1985).

A study done to investigate selected long-range effects of a preschool program on the children in Detroit found that the preschool group outperformed the non-preschool group on standardized tests in reading, beginning in grade three and continued all the way through grade eleven (Sevigny, 1987).

Other studies reveal that experimental groups out-perform controls up through the fourth grade. After that, scores from the experimental group and the control groups came closer together (Gray, 1983).

In their study of four different preschool programs, Miller and Bizzell (1983) found that by the end of second grade most experimental groups showed substantial losses from their end of

pre-kindergarten scores. However program differences in school achievement for both reading and math which emerged at the end of second grade were still present at the end of sixth grade. Sevigny (1987) found in her study of a Title I Preschool experience on academic achievement through grade five that the rate of growth of the experimental group exceeded that of the control group at every level with the exception of second grade mathematics.

Another benefit of a preschool experience seems to be a reduced placement in compensatory education (Gray, 1983; Sevigny, 1987) and fewer retainments in grade (Haskins, 1989). There is also evidence to show experimental groups are significantly more likely to graduate from high school, enroll in post-secondary education and find employment. They are less likely to commit crimes, have children in their teen-age years, or receive welfare assistance (Weikart and Schweinhart, 1986; Seefeldt, 1985). Investing in preschool programs for at-risk children will produce multifold dividends for society in savings for remedial education, health services and less crime over future years (Piccigallo, 1988; Weikart and Schweinhart, 1986).

While good early childhood programs are an effective way to improve the life chances of disadvantaged children, formal academic programs may be inadequate to the task because they fail to have desired social behavioral results (Weikart and Schweinhart, 1986). Be exposing our children to academics we are

stripping them of their childhood rights, putting them under too much pressure, and producing bad attitudes towards future schooling (Evard, 1988).

The principal source of development in the early years is play. When educators use play-time for academic development they actually take away from the child the symbolic enrichment time that is later needed for learning to read (Piccigallo, 1988; Gallagher and Coche', 1987). If adults treat initiative as misbehavior, or failure to pay attention, then the child may develop a sense of guilt about his capacity to perform and not learn the skills of self-direction (Weikart and Schweinhart, 1986). Many children participating in an academic preschool tend to avoid experimentation and risk-taking (Picccigallo, 1988).

Evans, Hillman, Nieman, and Gastright determined no significant differences in academic gains for those children who attended preschool (Helmich, 1988).

Haskins (1989) reviewed information on the development and performance of preschool participants once they were between the ages of nine and 19 years old. Three years later they did a follow up study which showed that on math subtests results were statistically significant and robust at third grade; significant, though not robust at fourth and fifth grade; and neither significant nor robust at sixth grade. On reading subtests results were statistically significant only at third grade and were not robust for any grade. Gains on standardized I.Q. tests,

as well as on tests of socioemotional development, decline within a few years.

Miller and Bizzell (1983) compared four different preschool programs and found that by the end of second grade most experimental groups showed substantial losses from their end-of-pre-kindergarten scores. However, males who attended a Montessori preschool maintained achievement gains through the tenth grade.

Present Study in Relation to Previous Studies

The relationship of this study to previous studies was for the most part general. In reviewing the literature the researchers found significant amounts of information and research concerning the effects of preschool on the lives of teenagers, but a much less significant amount was found on the earlier effects.

The researchers reviewed literature addressing the effects of preschool at each of the grade levels studied but not enough research was found to determine a significant difference. While it is generally accepted that preschool experience is important, especially for at-risk students, there may not be a demonstrated difference on academic achievement in mathematics and reading.

Some studies report gains in achievement as well as other benefits, many of which last through high school and beyond. Other studies report no significant academic gains. Still other researchers report negative effects such as producing bad

attitudes toward school caused by too much pressure to perform successfully.

Plan of Study

This study included two groups of students in first through fourth grade in the Estill County (KY) School District. The students were grouped according to preschool experience. The experimental group included all students who had attended preschool. The control group was selected randomly from all the students in first, second, third, and fourth grades who did not have preschool experience.

The subjects of this study were 208 elementary students from the Estill County school system. All the students were white, and from low to middle socioeconomic classes.

The subjects in the experimental group were 46 first grade students, 20 second grade students, 15 third grade students, and 23 fourth grade students, for a total of 104 students. The control group was made up of an equal number of students from each grade selected randomly, as indicated above. The students were enrolled in the five elementary schools in Estill County in the school year 1989-1990.

Research Design

The type of design chosen was a quasi-experimental posttest-only control group design (see Figure 1). This design was selected because it controls for many sources of invalidity and because random assignment of subjects to the control group was

possible. A major potential threat to internal validity associated with this study was maturation. This was controlled to some extent by the use of the control group.

Group	Assignment	N	Treatment	Posttest
1		104	Preschool	CTBS
2	Random	104	No Preschool	CTBS

Figure 1. Experimental Design

Procedure

Prior to the study, permission was obtained from the Instructional Supervisor for Estill County schools to gain access to the students' academic records and test scores. The public schools coordinator for the Kentucky River Foothills Development Corporation (KRFDC), which conducts the Head Start program in the county, provided a list of the names of all the students who attended Head Start for the years 1985-1988. The Director of Happy House Pre-School (a private program) also provided the names of students who attended this program.

Instruments to be Used

The Comprehensive Test of Basic Skills (CTBS) Levels C, D, E, and F, Form U, were used as the data gathering instrument. First, second, third, and fourth grade scores were taken from the cumulative folders of the 208 students participating in the

study. The scores used were taken from the total reading achievement and the total math achievement of the students.

Hypotheses

The null hypotheses tested in this study were as follows:

There is no significant difference in the total reading and math achievement for first grade students who attended preschool compared to those who did not attend as measured by the CTBS.

There is no significant difference in the total reading and math achievement for second grade students who attended preschool compared to those who did not attend as measured by the CTBS.

There is no significant difference in the total reading and math achievement for third grade students who attended preschool compared to those who did not attend as measured by the CTBS.

There is no significant difference in the total reading and math achievement for fourth grade students who attended preschool compared to those who did not attend as measured by the CTBS.

Findings

All the null hypotheses were accepted. The Statistics With Finess Computer Program was used to analyze the data. No significant differences were found for either of the four hypotheses at the .05 level of significance using the t-test of significance of difference between means.

1. No significant difference was found in the first grade ($N = 46$) experimental group for reading ($\bar{X} = 57.00$) as compared to the control group ($\bar{X} = 56.26$), $t = -0.1283$, $p > .05$. No

significant difference was found for math in the experimental group ($\bar{X}$ = 58.83) as compared to the control group ($\bar{X}$ = 58.87), t = .0073, p > .05.

2. No significant difference was found in the second grade (N = 20) experimental group for reading ($\bar{X}$ = 62.15) as compared to the control group ($\bar{X}$ = 49.80), t = -1.3558, p > .05. No significant difference was found for math in the experimental group ($\bar{X}$ = 76.60) as compared to the control group ($\bar{X}$ = 64.90), t = -1.9359, p > .05.

3. No significant difference was found in the third grade (N = 15) experimental group for reading ($\bar{X}$ = 61.73) as compared to the control group ($\bar{X}$ = 52.27), t = -1.0249, p > .05. No significant difference was found for math in the experimental group ($\bar{X}$ = 59.60) as compared to the control group ($\bar{X}$ = 46.27), t = -1.5031, p > .05.

4. No significant difference was found in the fourth grade (N = 23) experimental group for reading ($\bar{X}$ = 101.83) as compared to the control group ($\bar{X}$ = 47.83), t = -1.4219, p > .05. No significant difference was found for math in the experimental group ($\bar{X}$ = 68.52) as compared to the control group ($\bar{X}$ = 48.09), t = -2.7131, p > .05.

Conclusions and Recommendations

The results of this study did not support the research hypothesis; students in grades one through four who had attended preschool did not score significantly better on the CTBS in

reading or math than those who did not attend. The results of this study are consistent with those of Evans, Hillman, Nieman, and Gastright (Helmich, 1988) concerning academic gains.

There is undeniably a great need for more and better research in the area of preschool effects. Research needs to continue to search for more effective preschool programs which might make a significant difference in the learning and development of the children in our elementary schools. Because of the government's focus on a public pre-kindergarten this specific problem needs to be further investigated. The researchers would recommend that a larger sample be used than the one used in this study. This may serve as a pilot study.

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